

Energy

31 December 2019

Abstract

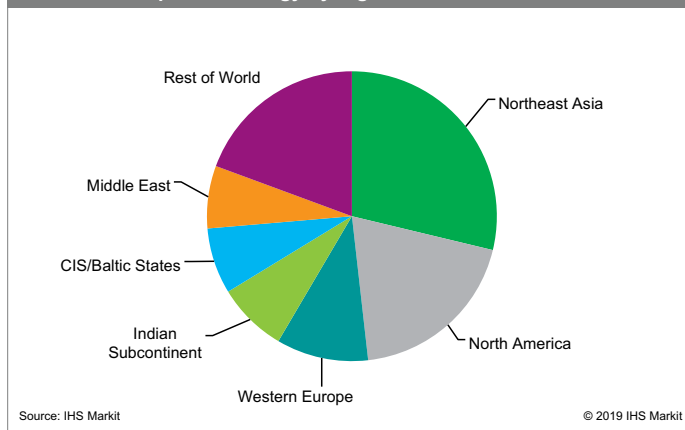
This new CEH report presents an overview of the global energy industry; it focuses on the fossil fuels (crude oil, natural gas, and coal), but also discusses nuclear energy, hydroelectric power, and renewables. Renewables include primarily wind and solar energy, but the report also touches upon geothermal, biomass, and other technologies.

The main feature of the energy world from 2019 to 2050 is an intense competition for energy market share. Suppliers of oil, natural gas, coal, nuclear power, hydroelectricity, biomass, and renewable energy compete to maintain market share or displace incumbents. By the 2030s, after several decades of competition, no source of energy will command more than 30% of global primary energy demand. This has not happened before.

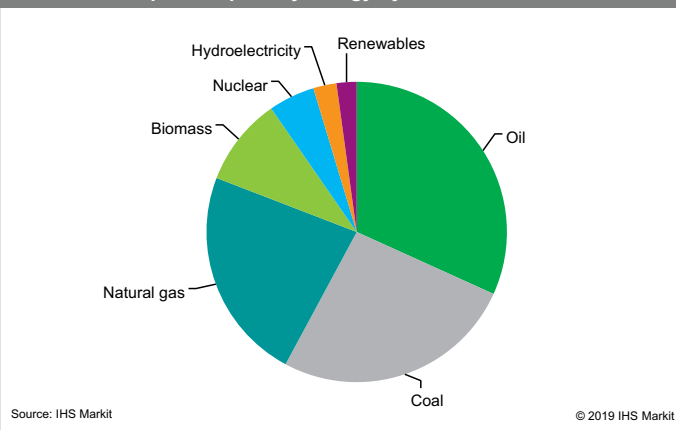
Also having an impact on energy consumption are environmental pressures regarding global warming and attempts to slow greenhouse gas (GHG) emissions of carbon dioxide (CO₂) and other pollutants. Despite the fact that GHG emissions have slowed, the absolute level of emissions continues to increase.

The following pie charts show world consumption of energy by region and by fuel.

World consumption of energy by region—2019



World consumption of primary energy by fuel—2019



This report provides IHS Markit's base case scenario. IHS Markit also tracks alternative scenarios, both more optimistic and more pessimistic, meaning there is potential for the world to move in one of these directions as well, much of which is dependent on geopolitical differences. The energy rivalry is driven by four factors: price differential, environmental concerns, technology improvements, and energy security. Alternatives loosen oil's grip on transport demand, while renewables increase competition with natural gas, coal, and nuclear in power generation.

For more detailed information, see the table of contents, shown below.

Contacts

Koon-Ling Ring • Koon-Ling.ring@ihsmarkit.com
 Maria deGuzman • Maria.deguzman@ihsmarkit.com

IHS Markit's Chemical Economics Handbook – Energy is the comprehensive and trusted guide for anyone seeking information on this industry. This latest report details global and regional information, including



Global summary;
regional coverage



Producers with
annual capacities
and plant sites



Production figures
and trends



Consumption and
forecasts by end use
application



Manufacturing
processes and
environmental issues



Trade – imports
and exports

Key benefits

IHS Markit's Chemical Economics Handbook – Energy has been compiled using primary interviews with key suppliers and organizations, and leading representatives from the industry in combination with IHS Markit's unparalleled access to upstream and downstream market intelligence and expert insights into industry dynamics, trade, and economics.

This report can help you

- Identify trends and driving forces influencing chemical markets
- Forecast and plan for future demand
- Understand the impact of competing materials
- Identify and evaluate potential customers and competitors
- Evaluate producers
- Track changing prices and trade movements
- Analyze the impact of feedstocks, regulations, and other factors on chemical profitability

Contents

Executive summary	8
Summary	11
Consumption	11
– Primary energy consumption	11
– Primary energy consumption by fuel	13
– Primary energy consumption by region	15
– World electricity production	15
– Primary energy consumption	15
– Electricity generation capacity	16
– Electricity generation by fuel type	18
– World energy consumption by sector	20
– Residential	22
– Commercial	22
– Agricultural	23
– Industrial	24
– Transportation	25
– Chemical feedstock	26
Capacity and power generation	27
– Gross power generating capacity	27
– Power generation	28
– Renewables	28
– Wind power	29
– Solar	30
– Total power generation	30
– Nonrenewable power generation	31
– Coal	32
– Natural gas	32
– Crude oil	33
– Nuclear power	34
– Hydroelectric power	34
– Renewable power generation	35
– Wind onshore	36
– Wind offshore	37
– Solar photovoltaic (PV)	37
– Solar CSP	38
– Geothermal	39
– Biomass and other	39
World population, GDP, and climate change	40
– Population	40
– Real GDP	41

– Carbon dioxide emissions	42
– Emissions by source	42
– Emissions by region	45
– Relationship of population and GDP to climate change	46
World prices	46
Supply and demand by region	48
North America	48
– Consumption	48
– Primary energy consumption by fuel	48
– Renewable energy by technology	48
– Energy consumption by sector	49
– Generation	50
– Gross power generating capacity by country	50
– Electricity generation	51
– Power generation by country	54
– Renewable power additions	55
– United States	55
– Canada	57
– Population, GDP, and climate change	57
– Population	57
– GDP	58
– Carbon dioxide emissions	58
– Relationship of population and real GDP to climate change	59
South America	60
– Consumption	60
– Primary energy consumption	60
– Renewable energy by technology	61
– Energy consumption by sector	62
– Generation	63
– Gross power generating capacity	63
– Electricity generation by fuel and technology	63
– Power generation	64
– Renewable power additions	65
– Population, GDP, and climate change	66
– Population	66
– GDP	66
– Carbon dioxide emissions	67
– Relationship of population and real GDP to climate change	67
Western Europe	68
– Consumption	68
– Primary energy consumption	68
– Renewable energy by technology	69
– Energy consumption by sector	70

– Generation	71
– Gross power generating capacity	71
– Electricity generation by fuel type and technology	71
– Power generation	72
– Renewable power additions	73
– Population, GDP, and climate change	73
– Population	73
– GDP	74
– Carbon dioxide emissions	74
– Relationship of population and real GDP to climate change	75
Central Europe	76
– Consumption	76
– Primary energy consumption	76
– Renewable energy by technology	77
– Energy consumption by sector	78
– Generation	79
– Gross power generating capacity	79
– Electricity generation	79
– Power generation	79
– Renewable power additions	80
– Population, GDP, and climate change	80
– Population	80
– Carbon dioxide emissions	80
– Relationship of population and real GDP to climate change	81
CIS and Baltic States	81
– Consumption	81
– Primary energy consumption	81
– Renewable energy by technology	82
– Energy consumption by sector	83
– Generation	84
– Gross power generating capacity	84
– Electricity generation by fuel type and technology	84
– Power generation	85
– Renewable power additions	86
– Population, GDP, and climate change	86
– Population	86
– GDP	86
– Carbon dioxide emissions	86
– Relationship of population and real GDP to climate change	87
Middle East	88
– Consumption	88
– Primary energy consumption	88
– Renewable energy by technology	89

– Energy consumption by sector	90
– Generation	91
– Power generating capacity	91
– Electricity generation	91
– Power generation	92
– Renewable power additions	93
– Population, real GDP, and climate change	93
– Population	93
– GDP	94
– Carbon dioxide emissions	94
– Relationship of population and real GDP to climate change	95
Africa	96
– Consumption	96
– Primary energy consumption by fuel	96
– Renewable energy by technology	97
– Energy consumption by sector	98
– Generation	99
– Gross power generating capacity	99
– Electricity generation by fuel type and technology	99
– Power generation	100
– Renewable power additions	101
– Population, real GDP, and climate change	102
– Population	102
– GDP	102
– Carbon dioxide emissions	102
– Relationship of population and real GDP to climate change	103
Indian Subcontinent	103
– Consumption	104
– Primary energy consumption	104
– Renewable energy by technology	104
– Energy consumption by sector	105
– Generation	106
– Gross power generating capacity	106
– Electricity generation by fuel type and technology	106
– Power generation	107
– Renewable power additions	108
– Population, real GDP, and climate change	109
– Population	109
– GDP	110
– Carbon dioxide emissions	110
– Relationship of population and real GDP to climate change	110
Northeast Asia	110
– Consumption	111

– Primary energy consumption	111
– Renewable energy by technology	111
– Energy consumption by sector	112
– Generation	113
– Gross power generating capacity	113
– Electricity generation by fuel type and technology	113
– Power generation	114
– Renewable power additions	115
– Population, real GDP, and climate change	116
– Population	116
– GDP	116
– Carbon dioxide emissions	117
– Relationship of population and real GDP to climate change	118
Southeast Asia	118
– Consumption	119
– Primary energy consumption	119
– Renewable energy by technology	119
– Energy consumption by sector	120
– Generation	121
– Gross power generating capacity	121
– Electricity generation by fuel type and technology	122
– Power generation	122
– Renewable power additions	123
– Population, real GDP, and climate change	124
– Population	124
– GDP	124
– Carbon dioxide emissions	124
– Relationship of population and real GDP to climate change	124
Additional resources	126
Revisions	127

IHS Markit Customer Care

CustomerCare@ihsmarkit.com

Americas: +1 800 IHS CARE (+1 800 447 2273)

Europe, Middle East, and Africa: +44 (0) 1344 328 300

Asia and the Pacific Rim: +604 291 3600

Disclaimer

The information contained in this report is confidential. Any unauthorized use, disclosure, reproduction, or dissemination, in full or in part, in any media or by any means, without the prior written permission of IHS Markit or any of its affiliates ("IHS Markit") is strictly prohibited. IHS Markit owns all IHS Markit logos and trade names contained in this report that are subject to license. Opinions, statements, estimates, and projections in this report (including other media) are solely those of the individual author(s) at the time of writing and do not necessarily reflect the opinions of IHS Markit. Neither IHS Markit nor the author(s) has any obligation to update this report in the event that any content, opinion, statement, estimate, or projection (collectively, "information") changes or subsequently becomes inaccurate. IHS Markit makes no warranty, expressed or implied, as to the accuracy, completeness, or timeliness of any information in this report, and shall not in any way be liable to any recipient for any inaccuracies or omissions. Without limiting the foregoing, IHS Markit shall have no liability whatsoever to any recipient, whether in contract, in tort (including negligence), under warranty, under statute or otherwise, in respect of any loss or damage suffered by any recipient as a result of or in connection with any information provided, or any course of action determined, by it or any third party, whether or not based on any information provided. The inclusion of a link to an external website by IHS Markit should not be understood to be an endorsement of that website or the site's owners (or their products/services). IHS Markit is not responsible for either the content or output of external websites. Copyright © 2020, IHS Markit®. All rights reserved and all intellectual property rights are retained by IHS Markit.

